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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/840,233	STEVENS, ASHLEY MILES
Office Action Summary	Examiner	Art Unit	
	Eueng-nan Yeh	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-57* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 May 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All   b)☐ Some * c)☐ None of:

   1.☒ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date <u>May 07, 2004</u>.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1.   Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which

papers have been placed of record in the file.

Specification

2.   The title of the invention, "Data Processing System" is too general to reveal the

real intention to which the claims are directed. A new title is suggested: "Performance

Controlling Parameter Setting Method in Image Processing".

Claim Objections

3.   The following quotations of 37 CFR 1.75(a) and (d)(1) are the basis of objection:

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming
the subject matter which the applicant regards as his invention or discovery.

(d) (1) The claim or claims must conform to the invention as set forth in the remainder of the
specification and the terms and phrases used in the claims must find clear support or
antecedent basis in the description so that the meaning of the terms in the claims may be
ascertainable by reference to the description.

4.   Claims 14, 33, and 52 are objected to under 37 CFR 1.75(d)(1), as failing to

conform to the invention as set forth in the remainder of the specification.

Claim 14, line 2 "an estimator" and line 3 "group of". There is no clear support or

antecedent basis for the concept of "estimator" and "group" in the description. Applicant

may either point out where or how the original specification describes this limitation, or

amend the specification to describe this feature without adding new matter. Same

problems occur on claims 33 and 52.

5.   Claims 6, 7, 8,13, 15, 16, 25, 26, 32, 34, 35, 44, 45, 46, 51, 53, and 54 are

objected to under 37 CFR 1.75(a), as failing to particularly point out and distinctly claim

the subject matter which application regards as his invention or discovery.

Claim 6, line 2 "image field **and** image frame". The word "**and**" used in claim is

inconsistent with the specification "one data block is representative of an image frame

or an image field", page 5, line 17.   Same error found in claims 7, 13, 15, 16, 25, 26,

32, 34, 35, 44, 45, 51, 52, and 54. This appears to be a typographical error.   The claim

statement "image field **and** image frame" will be interpreted as "image field ~~and~~ **or**

image frame".

.   Claim 8, line 1 "according to claim 5". This appears to be a typographical error.

It will be interpreted as "according to claim ~~5~~ 7".

Claim 46, line 1 "according to claim 35". This appears to be a typographical

error. It will be interpreted as "according to claim 3~~5~~ **45**".

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent
Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV,
reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

7.   Claims 20-38 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 20-38 defines a computer program embodying functional descriptive material. However, the claim does not define a computer-readable medium or computer-readable memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium"

which are deemed non-statutory (refer to "note" below). Any amendment to the claim

should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9.   Claims 1-6, 17-18, 20-25, 36-37, 39-44, and 55-56 are rejected under 35 U.S.C.

102(b) as being anticipated by Ogoro (GB 2 345 774 A).

Regarding claims 1, 20, and 39, Ogoro discloses:

initial processing stage of said processing operation on said at least one data block (as

depicted in figure 1, numeral 4 is the digital signal processor, DSP, "a DSP for

performing various digital signal arithmetic processing operations in accordance with an

arithmetic processing request" page 5, line 23; "In the initial state such as a power-on

state, a predetermined frequency corresponding to an arithmetic processing amount in

the DSP 4 is instructed from the clock frequency calculation unit 7 to the clock generator

8..." page 7, line 27);

deriving from at least one result of said initial processing stage a complexity measure

indicative of an amount of data processing required to perform at least one further

processing stage of said processing operation upon said at least one data block (as

depicted in figure 1, numeral 6 the arithmetic processing amount estimation unit is the

complexity measure, "the arithmetic processing amount estimation unit 6 estimates the

current arithmetic processing amount in the DSP 4..." page 8, line 12);

setting said performance controlling parameter to a predicted value in dependence upon

said complexity measure (as depicted in figure 1, numeral 7 calculate the performance

controlling parameter, clock frequency, in dependence upon numeral 6 the complexity

measure, numeral 8 is the clock generator to set up said performance controlling

parameter; see also page 8, lines 9-24); and

performing said at least one further processing stage upon said at least one data block

subject to said predicted value of said performance controlling parameter (as depicted

in figure 1, numeral 8 the newly calculated clock frequency, i.e. the predicted

performance controlling parameter, will feed to numeral 4 to process next data input;

see also figure 4 the transition of frames processed from clock speed S_0 to S_1).

Regarding claims 2, 21, and 40, said performance controlling parameter is at

least one of a processor frequency and a processor operating voltage of said data

processing apparatus (as depicted in figure 1, numeral 7 "A clock frequency calculation

unit for calculating a new frequency of the clock to be supplied to the DSP 4..." page 6,

line 14; the processor frequency is the performance controlling parameter).

Regarding claims 3, 22, and 41, said complexity measure is also derived in

dependence upon a result of a processing operation performed on at least one

preceding data block of said input data stream (as depicted in figure 1, numeral 6 is the

complexity measure, "numeral 6 denotes an arithmetic processing amount estimation

unit for estimating an arithmetic processing amount in the DSP 4 on the basis of

information from the controller 5" page 6, line 11).

Regarding claims 4, 23, and 42, said result of said processing operation on said

preceding data block is a processing time ("In this embodiment, all tasks issued to the

DSP 4 must be completed within a frame having a predetermined period of time" page

7, line 8).

Regarding claims 5, 24, and 43, said complexity measure is scaled in

dependence upon said result of said processing operation on said preceding data block

to derive a value for said performance controlling parameter ("The arithmetic processing

amount is assumed to be proportional to the product of the arithmetic processing speed

and time" page 7, line 14. To simplify the explanation, set variable A be the arithmetic

processing amount, and T be the time to process A, then the predicted process time T'

for next block of data A' is: T' = (A' / A) T. Thus the complexity measure T' is scaled by

A'/A and the clock frequency calculation unit (figure 1, numeral 7) needs to be adjusted

accordingly).

Regarding claims 6, 25, and 44, at least one of said plurality of data blocks of

said input data stream comprises one of an image field ~~and~~ or image frame (image

frame as depicted in figure 4).

Regarding claims 17, 36, and 55, said predicted value of said performance

controlling parameter (as depicted in figure 1, numeral 7 is the performance controlling

parameter unit) is selected from a predetermined range of parameter values ("the

frequency of the clock supplied from the clock generator *(figure 1, numeral 8)* to the

DSP is controlled on the basis of an arithmetic processing amount in the DSP" page 5,

line 15; this is to say that the selection (figure 1, numeral 8) is limited to arithmetic

processing amount which is predetermined by the system's central processing unit).

Regarding claims 18, 37, and 56, said predicted value of said performance

controlling parameter is set in dependence upon at least one of a target processing time

and a target power consumption level ("present invention relates to a DSP "Digital

Signal Processor" control apparatus and method and, more particularly, to a DSP

control apparatus and method capable of reducing DSP power consumption" page 1,

line 5).

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to be
> patented and the prior art are such that the subject matter as a whole would have been obvious
> at the time the invention was made to a person having ordinary skill in the art to which said
> subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

11.   Claims 19, 38, and 57 are rejected under 35 U.S.C. 103(a) as being

unpatentable over the combination of Ogoro and Gawne et al. (U.S. 5,420,787).

Regarding claims 19, 38, and 57, Ogoro discloses ways to define processing

frequency and then to adjust the processing power consumption.

Ogoro does not explicitly disclose what to do when target processing time or

target power consumption level cannot be met.

Gawne, in the same field of endeavor of signal analysis ("The present invention

relates to the field of neuron signal analysis" at column 1, line 7), teaches ways to set up

priority order during process. "low priority operations are performed only if sufficient

computing power is available after the high and medium priority operations" at column

6, line 19.

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to include the data processing system Ogoro made with priority schema

taught by Gawne such that major and important features can be captured when the

predicted processing time or power cannot be met.

12.   Claims 7-8, 10, 12, 15-16, 26-27, 29, 31, 34-35, 45-46, 48, 50, and 53-54 are

rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ogoro

and Kim et al. (U.S. 2003/003128 A1).

Regarding claims 7, 26, and 45, Ogoro discloses complexity measure is derived

from the amount of arithmetic processing. Ogoro does not explicitly disclose other

features used.

Kim, in the same field of endeavor of "video and image coding" in paragraph 5,

line 1, teaches many features for the complexity measure: "complexity measure in

accordance with one embodiment of the present invention is relatively invariant with the

quantization parameter (QP) ... the bit count for non-texture information, such as frame

headers/syntax and motion vectors ..." in paragraph 111, line 2, see also "The

complexity measure $C_{g,i}$ addresses both the motion and texture bit count ... " in

paragraph 113, line 1. Kim also teaches " the present invention can be used with a

variety of video compression standards, such as, by way of example, the MPEG-4

standard, as well as MPEG-2, MPEG-2..." in paragraph 34, line 7.

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to have the data processing system Ogoro made with more features in the

complexity measure as taught by Kim, in order not only to "provides efficient error

resiliency by selectively and adaptively encoding macroblocks in a predicted frame" in

paragraph 16, line 2 but also to have a more complete complexity measure.

Regarding claims 8, 27, and 46, said one or more features used to derive said

complexity measure comprise a count of constituent image items in said image

rendering display list (discussed in claims 7, 26, and 45, bit count is used for the

complexity measure).

Regarding claims 10, 29, and 48, said performance controlling parameter is at

least one of a processor frequency and a processor operating voltage of a graphics co-

processor (as depicted in Ogoro figure 1, numeral 7 the clock frequency calculation unit

is the performance controlling parameter calculation unit, therefore, "a clock having a

new frequency is supplied to the DSP 4" page 8, line 23. The Digital Signal Processor

"performs various signal processing operation" Ogoro page 1, line 14 and graphics co-

processor can be one of processors).

Regarding claims 12, 31, and 50, said one or more features used to derive said

complexity measure include texture formats associated with said constituent image

elements (discussed in claims 7, 26, and 45, complexity measure includes texture

formats).

Regarding claims 15, 34, and 53, said performance controlling parameter is set

by estimating a number of memory accesses per said one of an image field and or an

image frame in view of said derived complexity measure (as discussed in claims 7, 26,

and 45, bit count is used for the complexity measure and the number of RAM accesses

is proportional to the bit counts).

Regarding claims 16, 35, and 54, said one of an image field and an image frame

is MPEG encoded and said complexity measure is a number of motion vectors required

to decode said one of an image field ~~and~~ or an image frame (discussed in claims 7, 26,

and 45, the image frame is MPEG encoded).

13.   Claims 9, 13, 28, 32, 47, and 51 are rejected under 35 U.S.C. 103(a) as being

unpatentable over the combination of Ogoro and Kim as applied to claims 7, 26, and 45

discussed above, and further in view of Jeddeloh (U.S. 6,252,612 B1).

Regarding claims 9, 28, and 47, Ogoro and Kim combination disclose many

features for complexity measure. Ogoro and Kim combination does not explicitly

disclose 3-D image elements.

Jeddeloh, in the same field of endeavor of computer graphics ("a computer

system having a second memory controller including an accelerated graphics port" at

column 1, line 18), teaches the importance of this accelerated graphics port for:

a) 3-D data: "the emergence of high-bandwidth applications, such as three dimensional

(3D) graphics applications, threatens to overload the PCI bus" at column 1, line 40;

b) screen resolution: "to transfer an average 3D scene (polygon overlap of three) in 16-

bit color at 30 frames/sec at 75 Hz screen refresh, estimated bandwidths of 370

megabytes/sec to 840 megabytes/sec are needed for screen resolutions from 640X480

resolution (VGA) to 1024X768 resolution (XGA)" at column 1, line 56.

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to have the image data processing system Ogoro and Kim made with

three dimensional graphics features as one of constituent image items as taught by

Jeddeloh, in order to avoid the "threatens to overload the PCI bus" at Jeddelph column

1, line 42.

Regarding claims 13, 32, and 51, said one or more features used to derive said

complexity measure comprises a screen resolution associated with said one of an

image field and or an image frame (discussed in claims 9, 28, and 47, Ogoro and Kim

combination does not explicitly disclose screen resolution.

Jeddeloh does teach the importance of image process and screen resolution.

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to include the image data processing system Ogoro and Kim made with

screen resolution as complexity measure as taught by Jeddeloh, for the reason that

"rendering of 3D graphics on a display requires a large amount of bandwidth..."

Jeddeloh column 1, line 62).

14.   Claims 11, 30, and 49 are rejected under 35 U.S.C. 103(a) as being

unpatentable over the combination of Ogoro and Kim as applied to claims 7, 26, and 45

discussed above, and further in view of Lavelle (U.S. 2003/0179208 A1).

Regarding claims 11, 30, and 49, Ogoro and Kim combination disclose many feature lists from complexity measure. Ogoro and Kim combination does not explicitly disclose the deferred rendering graphics processor.

Lavelle, in the same field of endeavor of computer graphics ("a graphics computing system configured to dynamically adjust a number of rendering passes to achieve a targeted quality constrain" in paragraph 3, line 2), teaches the Z buffer operation: "hidden surface removal may cause some of the samples rendered earlier in the scene to be replaced by samples rendered later in the scene ... A cluttered scene with many objects in front of each other, as seen from the eye point, will have a higher depth complexity" in Lavelle paragraph 252, line 6.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to have the image data processing system Ogoro and Kim made with list from deferred rendering processor as taught by Lavelle, in order to "achieve a targeted quality constrain" in Lavelle paragraph 3, line 4.

15.   Claims 14, 33, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ogoro and Kim as applied to claims 7, 26, and 45 discussed above.

Regarding claims 14, 33, and 52 the combination of Ogoro and Kim disclose many features to comprise the complexity measure.

The combination of Ogoro and Kim does not explicitly disclose the step of graphics processing enable/disable.

As discussed in claims 7, 26, and 45, Kim teaches "Optionally, in high noise environment, the macroblock bit allocation process can be disabled or not used so that the decoder can assume that the QP *(quantization parameter)* is the same for each macroblock" in paragraph 152, line 1. This disable/enable graphics processing feature will affect the complexity measure.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to have the image data processing system Ogoro and Kim made for claim 7 with graphics processing features enable/disable function as taught by Kim, in order not only to "prevent the decoder from using the wrong QP when portions of a frame have been corrupted or lost" in Kim paragraph 152, line 4, but also to have a more complete complexity measure..

Conclusion

16.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Kim, U.S. 6,072,543 priority order processing.

17.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eueng-nan Yeh whose telephone number is 571-270-1586. The examiner can normally be reached on Monday-Friday 8AM-4:30PM EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian P. Werner can be reached on 571-272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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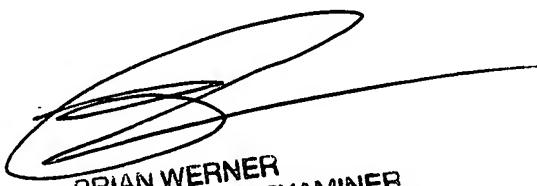
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